ISOCARB 12

Biomimetic Performance Booster for AP/Deo Formulations

Sasol Performance Chemicals

About Us

Sasol Performance Chemicals develops and markets a broad port-folio of organic and inorganic commodity and specialty chemicals and com-prises three key business divisions: Organics, Advanced Materials and Wax. Our offices in 18 countries serve customers around the world with a multifaceted portfolio of state-of-the-art chemical products and solutions for a wide range of applications and industries.

Surfactants, surfactant intermediates, fatty alcohols, linear alkyl benzene (LAB), short-chain linear alpha olefins, mineral oil-based and synthetic paraffin waxes, high-purity and ultra-high-purity alumina as well as high-quality carbon solutions form the basis of our key product range.

As individual as the industrial applications they serve, the tailor-made solutions offered by our products create real business value for customers. Ongoing research activities result in a continuous stream of innovative product concepts that help our customers position themselves successfully in future markets.

Our products are used in countless applications in our daily lives to add value, security and comfort. Typical examples include detergents, cleaning agents, personal care, construction, paints, inks and coatings, metalworking and lubricants, hot-melt adhesives, bitumen modification and catalyst support for automotive catalysts and refineries as well as other specialty applications including oil and gas recovery, agriculture, plastic stabilization, and polymer production. Every day, our researchers explore ways to improve our products and develop innovations that improve the quality of people's lives.

ISOCARB 12 Biomimetic Performance Booster for AP/Deo

ISOCARB 12 – Reduce Stress-Induced Sweat and Malodour

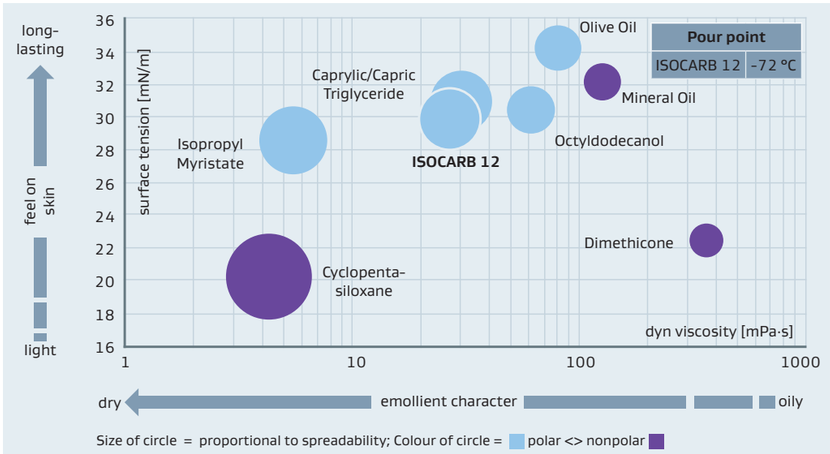
Description

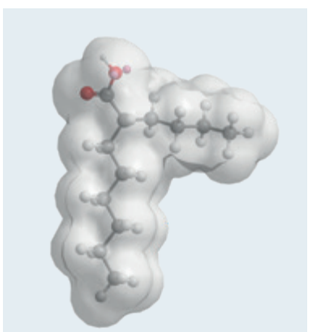
ISOCARB 12 is a primary, saturated carboxylic acid with defined branching of the carbon chain.

Features

- Colourless and odourless liquid acid with low pour point
- Highly polar and medium spreading emollient
- Emollient with excellent stability towards calcium and magnesium ions
- Compatible with silicones, lipophilic cosmetic ingredients and AP/Deo active ingredients

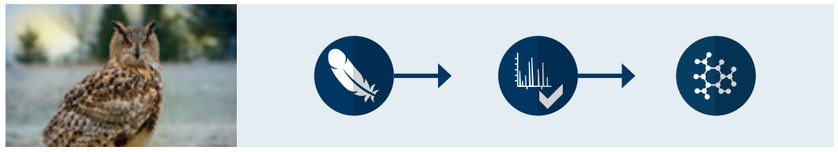
Figure 1:
ISOCARB 12 – emollient properties at a glance





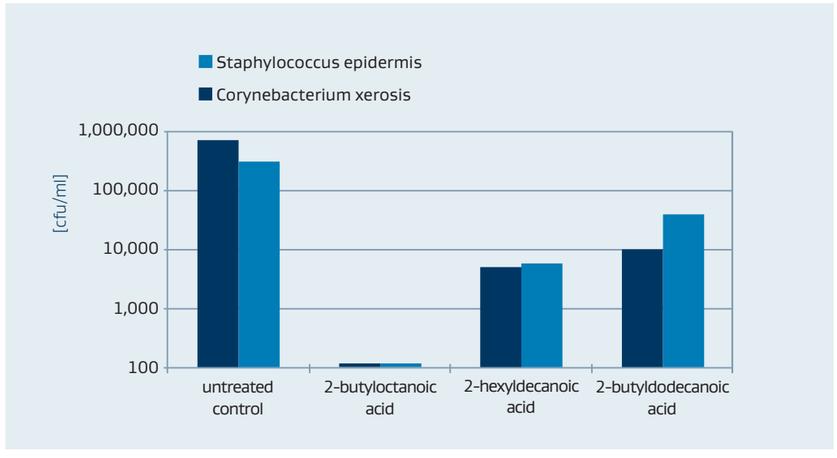
Lipid Composition of the Uropygial Gland Secretion of Asio Otus

The lipid composition of uropygial gland secretion of the long-eared owl (Asio otus) contains waxes of higher 2-alkyl-branched fatty acids, predominately 2-butyl-substituted fatty acids (55.6 %).[1)] These higher 2-alkyl-branched fatty acids are believed to contribute to the antimicrobial defence system of the avian plumage.



The antimicrobial efficacies (see Figure 2) have been evaluated of such higher 2-alkyl-branched fatty acids obtained either from uropygial gland secretion or chemically synthesised. The most pronounced reduction in bacterial growth was observed with 2-butyloctanoic acid suppressing the growth of staphylococcus epidermis and corynebacterium xerosis below detection limit. It could be also demonstrated that chemically synthesised 2-butyloctanoic acid displayed antimicrobial performance similar to that of the acid isolated from nature.[2)]

Figure 2:
Antimicrobial efficacy of 2-alkyl-branched fatty acids isolated from uropygial gland waxes[5)]



Study about the Prevention of Stress-Induced Sweating and Axillary Malodour Formation in Teenagers

The human axilla region is characterised by a dense arrangement of sebaceous, eccrine and apocrine sweat glands and provides an ideal humid and semi-occlusive environment for skin bacteria growth. The sweat secreted by the axillary glands contains various non-smelling precursor substances such as glutamine and steroids, which are biotransformed by lipophilic corynebacteria and staphylococci species into volatile, odorous substances such as 3-methyl-2-hexenoic acid and sulphanylalkanol.[3)]

During stressful situations in everyday life, the eccrine and apocrine sweat glands become activated, resulting in enhanced sweat secretion accompanied by a strong axillary odour and making it very unpleasant for the affected person.

Stink less – Under stress

A study[4)] was conducted to investigate stress-induced sweating and malodour formation in teenagers who are known to experience stressful situations such as exams at school or job interviews. A test panel of 40 healthy adolescents (20 females and 20 males) aged 16 to 18 years participated in the Trier Social Stress Test (TSST), considered to be the most standardised and reliable test set-up to induce moderate psychosocial stress in a laboratory environment. The TSST induced high amounts of sweat and strong axillary malodour in this test panel of teenagers (Figure 3 and Figure 4).

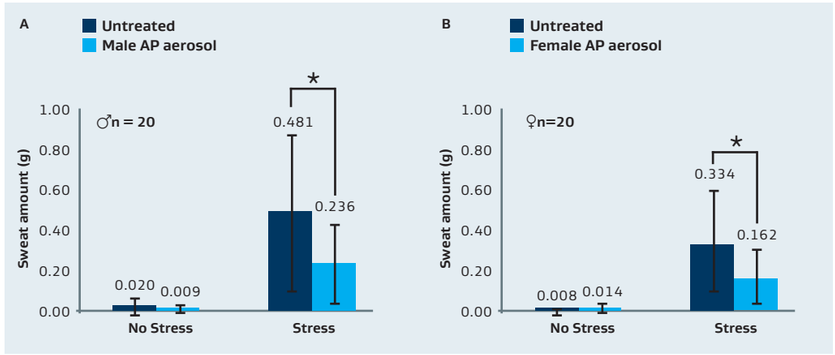
Specially developed to meet the needs of adolescent consumers, novel AP/Deo products (female and male AP aerosols) containing aluminium chlorohydrate (ACH) and 2-butyloctanoic acid (**ISOCARB 12**) were applied as AP/Deo active ingredients and parfume to mask sweat odour.

The study clearly showed that stress-induced axillary malodour among teenagers can be very effectively controlled by **a combination of aluminium chlorohydrate (ACH), 2-butyloctanoic acid (ISOCARB 12) and perfume.**

It was possible to reduce stress-induced sweat secretion under the challenging conditions of the Trier Social Stress Test (TSST) **by 50 % regardless of gender, thus indicating that the tested formulations have a very strong antiperspirant effect.**

Figure 3:
Emotional sweating during Trier Social Stress Test (TSST)[6]

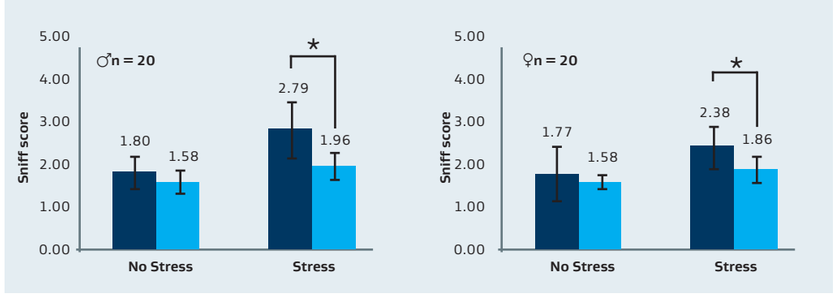
* Asterisks indicate significant differences (P < 0.05)



In a comparison of male and female teenagers, the test results also showed significantly higher stress-induced axillary odour scores (2.79 versus 2.38) for male teenagers caused by increased apocrine sweat gland activity due to a higher testosterone level. After application of the aerosol formulation containing **a combination of aluminium chlorohydrate (ACH), 2-butyloctanoic acid (ISOCARB 12) and parfume**, a significant decrease in malodour formation **of 30 % in male adolescents and 22 % in female adolescents** could be achieved.

Figure 4:
Axillary malodour production during Trier Social Stress Test (TSST)[6]

* Asterisks indicate significant differences (P < 0.05)



References

1) Jacob, J., Poltz, J., Chemical composition of uropygial gland secretion of owls, J. Lipid Res. 15, 243–248 (1974)

2) Jacob, J., Traupe, B., Roll, C., Eigener, U., Sauermann, G., Hoppe, U., Wolf, F., α,α-dialkylated acetic acids as novel nature-identical antimicrobials for the treatment of fungal infections and superinfections in humans, poster

3) Troccaz, M., Borchard, G., Vuilleumier, C., Raviot-Derrien, S., Niclass, Y.,Beccucci, S., Starkenmann, C., Gender-specific differences between the concentrations of nonvolatile (R)/(S)-3-methyl-3-sulfanylhexan-1-ol and (R)/(S)-3-hydroxy-3-methyl-hexanoic acid odour precursors in axillary secretions, Chem. Senses 34, 203–210 (2009)

4) Martin, A., Hellhammer, J., Hero, T., Max, H., Schult, J., Terstegen, L., Effective prevention of stress-induced sweating and axillary malodour formation in teenagers, Int. J. Cosmet. Sci. 33, 90–97 (2011)

Pictures taken from

5) Jacob, J., Traupe, B., Roll, C., Eigener, U., Sauermann, G., Hoppe, U., Wolf, F., α,α-dialkylated acetic acids as novel nature-identical antimicrobials for the treatment of fungal infections and superinfections in humans, poster

6) Martin, A., Hellhammer, J., Hero, T., Max, H., Schult, J., Terstegen, L., Effective prevention of stress-induced sweating and axillary malodour formation in teenagers, Int. J. Cosmet. Sci. 33, 90–97 (2011)

Physical Properties

Typical physical properties are listed in the table below. Actual properties will vary from lot to lot.

ISOCARB 12

Packaging:
160 to 180 kg in coated (phenol resin) steel drums

Storage:
Protect from moisture and sunlight; keep between 5 and 30 °C

Shelf life:
48 months from the date of manufacture, when properly stored and handled

Typical properties		
INCI name		Butyloctanoic acid
CAS no.		27610-92-0
Appearance @20 °C		clear, colourless liquid
Molecular weight	g/mol	200
Purity	wt %	96 min.
Water content	wt %	0.1 max.
Colour	Hazen	30 max.
Acid number	mg KOH/g	273 to 283
Ester number	mg KOH/g	0.3 max.
Refractive index	nD20	1.4393
Viscosity @20 °C	mPa·s	27.0
Density @20 °C	g/ml	0.885 to 0.890
Surface tension @20 °C	mN/m	29.9
Pour point	°C	-72
Boiling range	°C	270 to 298
Flash point	°C	157

Sasol is a producer of ingredients for cosmetics and personal care products. Our global manufacturing network along with highly skilled marketing, research and development teams are dedicated to helping you achieve your performance and formulation requirements. Take advantage of Sasol's experience in product development.

ISOCARB 12 – Medium spreading, pleasant and non-sticky emollient enhancing protection against stress-induced sweating and microbial-induced malodour formation in AP/Deo formulations

At Your Service

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